

What is claimed is:

1. An apparatus for supplying electricity to a substrate, comprising:
a plurality of contacts;
5 a current sensor attached to each of the plurality of contacts; and
a current regulator that controls current applied to each of the plurality of
contacts in response to the current sensor.
2. The apparatus of claim 1, further comprising a controller that determines non-
10 uniformity of current between each of the plurality of contacts.
3. The apparatus of claim 2, wherein the current regulator operates in response to
the controller.
- 15 4. The apparatus of claim 1, wherein the current regulator ensures that a similar current
level is applied to each of the plurality of contacts.
5. The apparatus of claim 1, further comprising a power supply that supplies the
current to each contact.
- 20 6. The apparatus of claim 5, further comprising a plurality of individual conductors, at
least one of the individual conductors connected from the power supply to each of the
plurality of contacts.
- 25 7. The apparatus of claim 6, wherein the current regulator further comprises a plurality
of varistors, at least one of the varistors connected to each of the individual conductors
to control current applied to each of the plurality of contacts.
8. The apparatus of claim 6, wherein the current regulator further comprises a current
30 control device that regulates the current over each of the individual conductors.
9. The apparatus of claim 1, further comprising a conformal ridge formed around the
periphery of the contacts.

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10. An method for supplying electricity to a substrate, comprising:
providing a plurality of contacts;
sensing the current applied to each of the plurality of contacts; and
5 controlling the current applied to each of the plurality of contacts in response to
the current sensor.
11. The method of claim 10, wherein controlling the current further comprises balancing
the current applied to each of the plurality of contacts.
- 10 12. The method of claim 10, wherein controlling the current further comprises varying
the resistance of a conductor that supplies the current to the contact.
13. The method of claim 10, wherein controlling the current further comprises varying
15 the current level applied to a conductor that supplies the current to the contact.
14. A method of forming a contact ring, comprising:
providing a substrate;
depositing at least one conductive layer on the substrate; and
20 depositing at least one insulative layer adjacent to the at least one conductive
layer, on the substrate.
15. The method of claim 14, further comprising electrically connecting a contact to at
least one of the conductive layers.
- 25 16. The method of claim 14, wherein at least one of the conductive layers is of
sufficient thickness such that after the depositing of at least one insulative layer, a
compliant ridge is defined in the insulative layer.
- 30 17. The method of claim 16, further comprising electrically connecting a contact to at
least one of the conductive layers, wherein the compliant ridge extends around the
periphery of the contact.

18. A contact ring for providing electrical contact between a wafer and a power supply, comprising:

- a conductive layer
- an insulative layer deposited above the conductive layer;
- 5 a contact in electrical contact with the conductive layer and extending through the insulative layer to an external surface; and
- a compliant ridge formed on the external surface, and extending about the periphery of the contact.

10 19. The contact ring of claim 18, wherein the insulative layer is a conformal layer, and the conductive layer is of a sufficient dimension to form the compliant ridge on the insulative layer.

20. The contact ^(ring) of claim 18, wherein the compliant ridge is formed by an
15 additional layer deposited on top of the insulative layer.

21. An apparatus for supplying electricity to a substrate, comprising:

- a metal deposition system comprising a deposition cell, an anode, and a cathode, the cathode comprising:
- 20 a plurality of contacts,
- a current sensor attached to each of the plurality of contacts, and
- a current regulator that controls current applied to each of the plurality of contacts in response to the current sensor.

25 22. The apparatus of claim 21, wherein the metal deposition system is an electroplating device.

23. The apparatus of claim 21, further comprising a compliant ridge formed on the external surface and extending about the periphery of the contact.

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